Applicant(s)	Michael J. Geile et al.	PRELIMINARY AMENDMENT
Serial No.	Unknown	
Filing Date	Herewith	
Group Art Unit	Unknown	
Examiner Name	Unknown	
Attorney Docket No.	100.070US27	
Title: DYNAMIC BANDWIDTH ALLOCATION		

Commissioner for Patents
Washington, D.C. 20231

Prior to initial review, please amend the above-identified application as follows:

IN THE SPECIFICATION

In the first line after the title, please insert the following:

--This application is a continuation application of U. S. Patent Application 09/397,443, filed September 15, 1999, and entitled "Dynamic Bandwidth Allocation".--

IN THE CLAIMS

Please add the following new claims 2-36 after deleting claim 1. New Claims 2-33 and 34-36 correspond to Claims 7-38 and 43-45, respectively, in the parent application. For the Examiner's convenience we have attached a claims table.

2. (New) A telecommunications system with a multi-carrier transmission scheme that dynamically allocates bandwidth among a plurality of service units, the system comprising:

a head end that transmits data over a transmission medium to the service units, the head end comprising a modem circuit for narrow band transmission in at least one transmission channel, each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband;

a control circuit in the head end that assigns each service unit to a subband for transmission and receipt of data; and

the control circuit is further operable to allocate a payload channel to a service unit in response to a request for a service unit.

3. (New) The system of claim 2, wherein the control circuit is operable assign a number of service units to each subband for selective use of the payload channels in the subband by the service units so as to increase the number of service units that can be coupled to the system.

4. (New) The system of claim 2, wherein the transmission medium comprises a hybrid fiber-coax telecommunications system.

5. (New) The system of claim 2, wherein the head end comprises at least one modem circuit for each transmission channel.

6. (New) A method for maintaining the quality of transmission from a head end to a service unit in a telecommunications system that uses multi-carrier transmission scheme with dynamic bandwidth allocation, the method of comprising the steps of:

allocating a first payload channel to a service unit in a subband of a transmission channel of the telecommunications system;

monitoring the quality of the first payload channel; and

when the quality of the first payload channel drops below a threshold, allocating a second, different payload channel to the channel unit.

7. (New) The method of claim 6, and further comprising the step of deallocating the first payload channel after communication over the second payload channel is established.

8. (New) The method claim 6, wherein the step of monitoring the quality of the first payload channel comprises the step of deriving a probable bit error rate for the first payload channel.

9. (New) The method of claim 8, wherein the step of deriving a probable bit error rate comprises the step of sampling a parity bit for the payload channel.

10. (New) The method of claim 6, wherein the step of allocating a second, different payload channel comprises the step of allocating a second payload channel in the same subband as the first payload channel.

11. (New) A method for dynamically allocating bandwidth to a service unit in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each including a number of payload channels, comprising the steps of:

receiving a request for a payload channel to provide a service unit that is assigned to a first subband;

selecting an available payload channel in the first subband;

determining if the payload channel is acceptable to provide the service to the service unit;

when the payload channel is acceptable, allocating the payload channel to the service unit;

when the payload channel is unacceptable, repeating the steps of selecting and determining to find an acceptable payload channel.

12. (New) The method of claim 11, wherein the step of selecting an available payload channel comprises the step of determining whether payload channels are available starting at approximately the middle of the transmission channel and examining the channels outwardly toward the edges of the transmission channel.

13. (New) The method of claim 11, wherein the step of determining if the payload channel is acceptable comprises the step of assessing the history of the bit error rate for the available payload channel to determine the transmission quality for the payload channel.

14. (New) The method of claim 11, and further comprising steps of:

determining if sufficient payload channels are available in the subband assigned to the service unit; and

reassigning the service unit to a different subband when there are not sufficient payload channels available.

15. (New) The method of claim 11, wherein the step of selecting an available payload channel comprises determining limitations on payload channels that can be used by a service unit from the service unit.

16. (New) The method of claim 11, wherein the step of selecting an available payload channel comprising determining limitations of the service unit, the limitations stored on the service unit.

17. (New) A method for allocating payload channels for a service that uses multiple payload channels in a telecommunications system with a multi-carrier transmission scheme to communicate with a service unit, the method comprising the steps of:

assigning an identifier for each payload channel that indicates the relative order of the multiple payload channels for the service;

monitoring the quality of the multiple payload channels;

when the quality of one of the payload channels drops below a threshold, allocating a different payload channel to replace the original payload channel for the service and; and

in the service unit, reordering the payload channels using the identifier for the original payload channel so that the proper order for the allocated payload channels is

maintained by the service irrespective of the order that the payload channels are received at the service unit.

18. (New) The method of claim 17, wherein the identifier distinguishes between B1, B2, and D channels for an ISDN service.

19. (New) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels, the method comprising:

selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system; and

selectively allocating payload channels within a subband to service units assigned to the subband.

20. (New) The method of claim 19, wherein selectively assigning service units comprises assigning the service units based on at least one of a type of the service unit, a likely load on a control channel for the service unit, a number of available payload channels in a subband, and historical data on transmission quality over the payload channels of the subband.

21. (New) The method of claim 19, wherein selectively assigning service units comprises assigning subbands to service units beginning with subbands substantially at the middle of the available bandwidth.

22. (New) The method of claim 19, wherein selectively assigning service units comprises assigning one or more service units to a selected subband.

23. (New) The method of claim 19, wherein selectively assigning service units comprises assigning at least two service units of different types to a selected subband.

24. (New) The method of claim 19, wherein selectively allocating channels within a subband comprises:

allocating a first payload channel to a service unit in a subband of a transmission channel of the telecommunications system;

monitoring the quality of the first payload channel; and

when the quality of the first payload channel drops below a threshold, allocating a second, different payload channel to the channel unit.

25. (New) The method of claim 24, and further comprising the step of deallocating the first payload channel after communication over the second payload channel is established.

26. (New) The method of claim 24, wherein the step of monitoring the quality of the first payload channel comprises the step of deriving a probable bit error rate for the first payload channel.

27. (New) The method of claim 26, wherein the step of deriving a probable bit error rate comprises the step of sampling a parity bit for the payload channel.

28. (New) The method of claim 24, wherein the step of allocating a second, different payload channel comprises the step of allocating a second payload channel in the same subband as the first payload channel.

29. (New) The method of claim 19, and further comprising selectively reassigning a service unit to another subband when sufficient channels are not available to handle a request from the service unit.

30. (New) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels and at least one control channel, the method comprising:

selectively assigning a first service unit to a subband located substantially at a center of the bandwidth; and

selectively assigning additional service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

31. (New) The method of claim 30, and further including:

selectively allocating channels within a subband to service units assigned to the subband.

32. (New) The method of claim 30, wherein selectively assigning a first service unit and selectively assigning additional service units comprises assigning the service units based on at least one of a type of the service unit, a likely load on a control channel for the service unit, a number of available payload channels in a subband, and historical data on transmission quality over the payload channels of the subband.

33. (New) A telecommunications system comprising:

a head end that transmits data over a transmission medium to a number of service units, the head end comprising a modem circuit for transmission in at least one of a number of subbands of a transmission bandwidth, each subband having a number of payload channels and a control channel;

a control circuit in the head end that assigns each service unit to a subband such that the service units are substantially evenly distributed over the subbands; and

the control circuit is further operable to allocate a payload channel to a service unit in response to a request for bandwidth for a service unit.

34. (New) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels, the method comprising:

selectively assigning a first service unit to a subband located substantially at a center of the bandwidth; and

selectively assigning additional service units to the subbands such that the load of the service units of the telecommunications system is substantially evenly distributed over the number of subbands of the system.

35. (New) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with a number of subbands, each subband including a number of payload channels, the method comprising:

determining at least one characteristic of a service unit; and

selectively assigning the service unit to a subband based on the at least one characteristic such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

36. (New) The method of claim 35, wherein determining at least one characteristic of a service unit comprises determining at least one of a type of the service unit, a likely load on a control channel for the service unit, and a likely load of the service unit.

REMARKS

Claims 2-33 and 34-36 (formerly claims 7-38 and 43-45) are pending in this application. Based on an Advisory Action, dated 30 January 2001, received in the parent, application no. 09/397,443, the objection to the drawings, the rejection of claims 19-29, 30-32, 34-36 (formerly claims 24-34, 35-37, 43-45) under 35 U.S.C. §112, and the rejection of claims 19-33 and 34-36 (formerly claims 24-38 and 43-45) under 35 U.S.C. §102(b) as being anticipated by McMullen, Jr. have been withdrawn. For clarity the arguments presented by the Applicant in a Reply filed on 04 December 2000 with respect to these rejections have been repeated below. In addition, response to the Examiner's rejection of claims 2-33 and 34-36 (formerly claims 7-38 and 43-45) under §102(e) as being anticipated by Fuhrmann and Fuhrmann et al. are also provided below.

For the Examiner's convenience in reviewing this response the following table indicating how the claims presented in this application correspond to the claims originally presented in parent application no. 09/397,443.

CLAIMS TABLE

Attorney Docket No. 100.070US27 Present Application	Attorney Docket No. 100.070US13 Parent Application Serial No. 09/397,443
Claim 2	Claim 7
Claim 3	Claim 8
Claim 4	Claim 9
Claim 5	Claim 10
Claim 6	Claim 11
Claim 7	Claim 12
Claim 8	Claim 13
Claim 9	Claim 14
Claim 10	Claim 15
Claim 11	Claim 16
Claim 12	Claim 17
Claim 13	Claim 18
Claim 14	Claim 19
Claim 15	Claim 20
Claim 16	Claim 21
Claim 17	Claim 22
Claim 18	Claim 23
Claim 19	Claim 24
Claim 20	Claim 25
Claim 21	Claim 26
Claim 22	Claim 27

Claim 23	Claim 28
Claim 24	Claim 29
Claim 25	Claim 30
Claim 26	Claim 31
Claim 27	Claim 32
Claim 28	Claim 33
Claim 29	Claim 34
Claim 30	Claim 35
Claim 31	Claim 36
Claim 32	Claim 37
Claim 33	Claim 38
Claim 34	Claim 43
Claim 35	Claim 44
Claim 36	Claim 45

Substantive Rejections and Objections

A. Objection to the Drawings

1. The Applicable Law

The Patent Rules specify requirements for drawings in an application. One requirement is found in 37 C.F.R. §1.81(a). This requirement states that "[t]he drawing in a nonprovisional application must show every feature of the invention specified in the claims."

2. Analysis

The Examiner objected to the drawings under 37 C.F.R. 1.83(a) for not showing every feature specified in the claims. Specifically, the Examiner noted two features as not being shown in the Figures. First, the Examiner specified that "the step of selectively assigning service units to the subbands such that the service units of the telecommunications system [are] evenly distributed over the number of subbands of the system" of claim 19 (formerly claim 24) is not shown in the drawings. Further, the Examiner stated that the element "selectively assigning additional service units to the subbands such that the service units of [the] telecommunications system are substantially evenly distributed over the number [of] subbands" of claims 30, 34, and 35 (formerly claims 35, 43 and 44, respectively) is not shown in the drawings.

Applicant respectfully asserts that these elements are in fact described in detail in the Specification. Specifically, these elements are described in the specification at page 194, line 26 to page 195, line 12. This portion of the specification is reproduced below.

> Figures 63, 64 and 65 are frequency spectrum diagrams that illustrate initial assignment of HISUs and MISUs to various subbands in a 6 MHz transmission channel. These Figures show that channel manager 900 attempts to evenly distribute the ISUs across the transmission channel. As depicted in Figure 63, channel manager 900 begins assigning subbands at the middle of the 6 MHz transmission channel. Channel manager 900 then moves out toward the ends of the transmission channel. For example, the first HISU is assigned to subband number 12 and the twenty-fourth HISU is assigned to subband 0. It is noted that more than one ISU can be assigned to a subband. As depicted in Figure 64, channel manager 900 initially assigns the first MISU to subbands 0 through 12 and the next MISU to subbands 11 through 23. As depicted in Figure 65, when HISUs and MISUs are assigned to the same subbands, channel manager assigns the subbands so as to evenly distribute the ISUs over the available subbands. It is noted that the factors listed for use in selecting a subband are shown by way of example and not by way of limitation. Other factors can be added and the weight given to each factor can be adjusted without departing from the spirit and scope of the present invention.

This portion of the specification makes reference to Figures 63, 64, and 65 which demonstrate examples of assigning service units to subbands so as to evenly distribute the service units over the subbands. Thus, the claimed features are shown in the drawings. Withdrawal of the objection is respectfully requested.

B. Rejection under Section 112, First Paragraph

1. The Applicable Law

The first paragraph of 35 U.S.C. §112 provides the basic requirements for the content of the specification of a patent application as follows:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention. (emphasis added).

This section of the statute requires that the specification include the following:

(A) A written description of the invention;

(B) The manner and process of making and using the invention (the enablement requirement); and

(C) The best mode contemplated by the inventor of carrying out his invention.

See, M.P.E.P. Section 2161. The Federal Circuit has interpreted the written description requirement to mean that an applicant's specification must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, i.e., whatever is now claimed. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991).

An objective standard for determining compliance with the written description requirement is, "does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). Under *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991), to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed.

2. Analysis

The Examiner rejected claims 19-32, and 34-36 (formerly claims 24-37 and 43-45, respectively) under 35 U.S.C. §112, First Paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the Examiner states that "[t]he specification does not originally support and/or inadequately describe the now claimed step of selectively assigning service units to the subbands such that the service units of the telecommunications system [are] evenly distributed over the number of subbands of the system" as stated in claim 19 (formerly claim 24). Further, the Examiner stated that the element "selectively assigning additional service units to the subbands such that the

service units of [the] telecommunications system are substantially evenly distributed over the number [of] subbands" as stated in claims 30, 34, and 35 (formerly claims 35, 43 and 44, respectively).

Applicant respectfully asserts that the claims are supported by an adequate disclosure in the original specification. Specifically, Applicant refers the Examiner to the arguments in section A.2. above with respect to the drawings. Applicant incorporates these arguments by reference. Applicant respectfully requests that the rejection be withdrawn.

C. Rejections under 35 U.S.C. §102 (b) and (e)

1. The Applicable Law

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbi* test, i.e., identity of terminology is not required. *In re Bond,* 910 F. 2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). *See,* M.P.E.P. 2131.

Anticipation focuses on whether a claim reads on a product or process disclosed in a prior art reference, not on what the reference broadly teaches. *Kalman v. Kimberyl-Clark Corp.,* 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter. *PPG Industries, Inc. v. Guardian Industries Corp.,* 75 F.3d 1558, 37 U.S.P.Q.2d 1618 (Fed. Cir. 1996).

2. Analysis

The Examiner rejected claims 19-33 and 34-36 (formerly claims 24-38 and 43-45, respectively) under 35 U.S.C. §102(b) as being clearly anticipated by McMullan, Jr. Applicant respectfully traverses.

Claim 19 (formerly claim 24) is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels. The method includes selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system and selectively allocating payload channels within a subband to service units assigned to the subband.

Claim 19 (formerly claim 24) is not fully met by McMullan. Specifically, McMullan does not describe a telecommunications system that includes a number of subbands with each subband including a number of payload channels as called for in claim 19 (formerly claim 24). Further, there is nothing in McMullan that describes selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system. Rather, McMullan purports to address problems with noisy channels by attempting to find the best quality channels at a given time. There is nothing in McMullan that addresses attempting to distribute the service units evenly over the subbands. Therefore, McMullan does not anticipate claim 19 (formerly claims 24).

Claims 20 through 29 (formerly claims 25-34) depend directly, or indirectly, from independent claim 19 (formerly claim 24). As such, claims 20 through 29 (formerly claims 25-34) include the patentable limitations of claim 19 (formerly claim 24). Thus, claims 20 through 29 (formerly claims 25-34) are likewise not anticipated by McMullan.

Claim 30 (formerly claim 35) is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels and at least one control channel. The method includes selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number subbands of the system.

Claim 30 (formerly claim 35) is not fully met by McMullan. As discussed above, McMullan does not describe a telecommunications system that includes a number of subbands with each of the subbands including a number of payload channels as called for in claim 30 (formerly claim 35). Further, McMullan does not describe selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and, then, selectively assigning additional service units to subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands. Therefore, McMullan does not anticipate claim 30.

Claims 31 and 32 (formerly claims 36 and 37, respectively) depend directly from claim 30 (formerly claim 35) and, as such, include the patentable limitations of claim 30 (formerly claim 35). Therefore, claims 31 and 32 (formerly claims 36 and 37, respectively) are also not anticipated by McMullan.

Claim 33 (formerly claim 38) is directed to a telecommunications system a head end that transmits data over a transmission medium to a number of service units, the head end comprising a modem circuit for transmission in at least one of a number of subbands of a transmission bandwidth, each subband having a number of payload channels and a control channel. The head end further including a control circuit in the head end that assigns each service unit to a subband such that the service units are substantially evenly distributed over the subbands. The control circuit is further operable to allocate a payload channel to a service unit in response to a request for bandwidth for a service unit.

Claim 33 (formerly claim 38) is not fully met by McMullan. McMullan does not describe a telecommunications system with a head end modem circuit that transmits in at least one of a number of subbands with each of the subbands including a number of payload channels and a control channel. Further, McMullan does not describe a control circuit in the head end that selectively assigns each service unit to a subband such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands. Therefore, McMullan does not anticipate claim 33 (formerly claim 38).

Claim 34 (formerly claim 43) is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a

number of payload channels. The method includes selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the load of the service units of the telecommunications system is substantially evenly distributed over the number subbands of the system.

Claim 34 (formerly claim 43) is not fully met by McMullan. Specifically, McMullan does not describe a telecommunications system that uses transmission channels with a number of subbands with each subband including a number of payload channels. Further, McMullan does not describe selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the load of the service units of the telecommunications system is substantially evenly distributed over the number subbands of the system. Therefore, McMullan does not anticipate claim 34 (formerly claim 43).

Claim 35 (formerly claim 44) is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with a number of subbands, each subband including a number of payload channels. The method includes determining at least one characteristic of a service unit and selectively assigning the service unit to a subband based on the at least one characteristic such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

Claim 35 (formerly claim 44) is not fully met by McMullan. McMullan is not directed to a telecommunications system with a number of subbands with each subband including a number of payload channels. McMullan further does not describe determining at least one *characteristic of a service unit* and selectively assigning the service unit to a subband based on the characteristic such that the service units are substantially evenly distributed over the number of subbands. Therefore, McMullan does not anticipate claim 35 (formerly claim 44).

Claim 36 (formerly claim 45) depends from claim 35 (formerly claim 44) and, as such, includes the patentable limitations of claim 35 (formerly claim 44). Thus, McMullan does not anticipate claim 36 (formerly claim 45).

Response to the arguments found in an Advisory Action, dated January 30, 2001, of Application 09/397,443

The Examiner states that "A telecommunication system that includes a number of subbands with each subband including a number of payload channels" is not claimed in claims 19, 30, 33 and 35 (formerly claims 24, 35, 38 and 44, respectively). Claims 19, 30, and 35 (formerly claims 24, 35 and 44, respectively) each include the above language or similar language in the preamble of each claim. For example, claim 19 (formerly claim 24) includes the following language "A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels." Claim 30 (formerly claim 35) , includes the following language "A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels and at least one control channel." And claim 35 (formerly claim 44) includes the following language "A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with a number of subbands, each subband including a number of payload channels."

In addition, claim 33 (formerly claim 38) comprises the following language "the head end comprising a modem circuit for transmission in at least one of a number of subbands of a transmission bandwidth, each subband having a number of payload channels and a control channel." This language is similar to the above language of claims 19, 30, and 35 (formerly claims 24, 35 and 44, respectively) but is found in the first limitation of claim 33 (formerly claim 38). As a result claim 33 (formerly claim 38) includes the limitation and other portions of the claim refer to this language. In addition, portions of claims 19, 30 and 35 (formerly claim 24, 35, and 44, respectively) include limitations after the preambles that refer to this language. As stated in *C.R. Bard, Inc. v. M3 Systems, Inc.*, 157 F.3d 1340, 48 USPQ2d 1225 (Fed. Cir. 1998) "A preamble may serve a variety of purposes, depending on its content. It may limit the scope of the claim, for example when patentability depends on limitations stated in the preamble, as in *In re Stencel*, 828 F.2d 751, 754, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987), or when the

preamble contributes to the definition of the claimed invention, as in 55 F.3d 615, 620, 34 USPQ2d 1816, 1820 (Fed. Cir. 1995)." In addition, Bard states "In this case, however, the preamble simply states the intended use or purpose of the invention, as in *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 868, 228 USPQ 90, 94 (Fed. Cir. 1985). Such a preamble usually does not limit the scope of the claim unless the preamble provides antecedents for ensuing claim terms and limits the claim accordingly. In *Vaupel Textilmaschinen KG v. Meccanica Euro Italia S.P.A.*, 944 F.2d 870, 880, 20 USPQ2d 1045, 1053 (Fed. Cir. 1991), for example, the preamble described a "reference point" that provided guidance in understanding and construing the claim."

The preamble of claims 19, 30, and 35 (formerly claims 24, 35, and 44, respectively) each provides antecedents for ensuing claims terms such as "subbands," "telecommunications system," and "payload channels" and limit the respective claims accordingly. This preamble serves a variety of purposes to include providing antecedents for ensuing claim terms and limits the claims accordingly.

Rejections under 35 U.S.C. §102(e)

The Examiner provides a response to Applicant's arguments to rejected claims 2-17 (formerly claims 7-22) under 35 U.S.C §102(e) as being anticipated by Fuhrman, et al. in the Advisory Action of January 30, 2001. Applicant respectfully traverses the rejection and provides the following.

Claim 2 (formerly claim 7) is directed to a telecommunications system with a multi-carrier transmission scheme that dynamically allocates bandwidth among a plurality of service units. The system includes a head end that transmits data over a transmission medium to the service units. The head end includes a modem circuit for narrow band transmission in at least one transmission channel, each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband. The system further includes a control circuit in the head end that assigns each service unit to a subband for transmission and receipt of data. The control circuit is further operable to allocate a payload channel to a service unit in response to a request for bandwidth for a service unit.

The only cited portion of Fuhrmann et al. that relates to channel allocation appears to be Figures 45A-C. Applicant respectfully asserts that nothing in the reference teaches or suggests the claimed technique for allocating channels in a system with subbands with each subband including a number of payload channels and a control channel. The Examiner directs the Applicant to a description of Figure 4A found at Column 15, lines 17 - 29. Figure 4A shows a typical data structure for a frame and the description of 4A found at Column 15, lines 17-29 does not teach or suggest the claimed technique for allocating channels in a system with subbands of claim 2 (formerly claim 7). Thus, this portion of the patent does not support the rejection. Thus, claim 2 (formerly claim 7) is not anticipated by the reference.

Claims 3-5 (formerly claims 8-10) depend directly, or indirectly, from independent claim 2 (formerly claim 7). As such, claims 3-5 (formerly claims 8-10) include the patentable limitations of claim 2 (formerly claim 7). Thus, claims 3-5 (formerly claims 8-10) are likewise not anticipated by Fuhrmann et al.

Claim 6 (formerly claim 11) is directed to a method for maintaining the quality of transmission from a head end to a service unit in a telecommunications system that uses a multi-carrier transmission scheme with dynamic bandwidth allocation. The method includes allocating a first payload channel to a service unit in a subband of a transmission channel of the telecommunications system and monitoring the quality of the first payload channel. When the quality of the first payload channel drops below a threshold, the method allocates a second, different payload channel to the channel unit.

Claim 17 (formerly claim 22) is directed to a method for allocating payload channels for a service that use multiple payload channels in a telecommunications system with a multi-carrier transmission scheme to communicate with a service unit. The method includes assigning an identifier for each payload channel that indicates the relative order of the multiple payload channels for the service. The method further monitors the quality of the multiple payload channels. When the quality of one of the payload channels drops below a threshold, the method allocates a different payload channel to replace the original payload channel for the service. In the service unit, the method reorders the payload channels using the identifier for the original payload channel

so that the proper order for the allocated payload channels is maintained by the service irrespective of the order that the payload channels are received at the service unit.

Applicant respectfully asserts that nothing in the reference meets the limitations of the claimed method for maintaining the quality of transmission as called for in claim 6 (formerly claim 11) since the reference does not contemplate reallocating channels based on the monitoring of the quality of transmissions on the channels. In addition, Applicant respectfully asserts that nothing in the reference meets the limitations of the claimed method for allocating payload channels as called for in claim 17 (formerly claim 22) since the reference does not contemplate reallocating channels for a service unit that uses multiple payload channels. The Examiner directs the Applicant to the following language found in Fuhrmann et al. "Constant link monitoring for noise, crosstalk and signal quality is performed in background cycling constantly through all codes and timeslots. When a fallback mode threshold is exceeded, fallback mode is initiated and maintained until condition return below threshold." Further, Applicant finds the following language, with respect to the "fallback mode," in Fuhrmann et al. "In fallback mode, the encoder output is divided into two symbols and transmitted separately." Applicant does not find reallocation of channels based on the monitoring of quality of transmissions on payload channels allocated to service units as found in claim 6 (formerly claim 11). Nor does Applicant find the reallocation of channels for a service unit that uses multiple payload channels as found in claim 17 (formerly claim 22). Thus, claims 6 and 17 (formerly claims 11 and 22, respectively) are not anticipated by the cited reference.

Claims 7-10 (formerly claims 12 –15) depend directly or indirectly from claim 6 (formerly claim 11) and as such include the patentable limitations of claim 6 (formerly claim 11). Thus, claims 7-10 (formerly claims 12-15) are also patentable.

Claim 18 (formerly claim 23) depends from claim 17 (formerly claim 22) and includes the patentable limitations of claim 17 (formerly claim 22). Therefore, claim 18 (formerly claim 23) is also not anticipated by the cited reference.

Claim 11 (formerly claim 16) is directed to a method for dynamically allocating bandwidth to a service unit in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands each

including a number of payload channels. The method includes receiving a request for a payload channel to provide a service to a service unit that is assigned to a first subband. The method further selects an available payload channel in the first subband, and determines if the payload channel is acceptable to provide the service to the service unit. When the payload channel is acceptable, the method allocates the payload channel to the service unit. When the payload channel is unacceptable, the method repeats the process of selecting and determining to find an acceptable payload channel.

The Examiner directs the Applicant to column 34, lines 9-23, of Fuhrmann et al. Applicant does not find the method for dynamically allocating bandwidth to a service unit in a telecommunications system as found in Claim 11 (formerly claim 16). Specifically, Applicant respectfully asserts that nothing in the reference meets the limitations of the claimed method for dynamically allocating bandwidth. Fuhrmann et al. does not contemplate allocating channels in a subband based on a determination as to whether the channel is an acceptable channel as called for in claim 11(formerly claim 16). Thus, claim 11 (formerly claim 16) is not anticipated by the cited references and should be allowed.

Claims 12-16 (formerly claims 17-21) depend directly or indirectly from claim 11 (formerly claim 16) and as such include the patentable limitations of claim 11 (formerly claim 16). Thus, claims 12-16 (formerly claims 17-21) are also patentable.

Conclusion

Applicant believes that the claims are in condition for allowance. Allowance of the claims is respectfully requested. If the Examiner has any questions or concerns regarding this application, please contact the undersigned at (612) 312-2205.

Respectfully submitted,

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David N. Fogg
Reg. No. 35,138

Attorneys for Applicant
Fogg Slifer & Polglaze, PA
P.O. Box 581009
Minneapolis, MN 55458-1009
T: 612-312-2200
F: 612-312-2250